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Original Study

Effect of Pain Education on Quality of Life of Chronic Low Back Pain Patients

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Abstract

Background: Chronic low back pain is a very common symptom in populations everywhere and is responsible for more years lived with disability world wide than any other condition. It is a main cause of activity limitation and work absence, moreover, reduced mobility can lead to significant alterations inquality of life in the longterm.

Objective: To find out the effect of pain education on Quality of life of chronic low back pain patients.

Methodology: Forth is study 40 subjects with chroniclow backpain who fulfill these lection criteria were recruited. Subjects have been divided into 2 groups based on simple random sampling (Lottery Method). Group A (Experimental Group) received pain education along with conventional exercises. Group B (Control Group) received only conventional exercises.Both groups received intervention for about 4 weeks with each session 45 minutes.

Result: Participantsin both groups experienced reduction in pain,fear, disability and improvement in Quality of life.

Conclusion: The results of this study concluded that there was no significant difference between pain education group and conventional exercise group.

Keywords: Chronic Low Back Pain; Fear avoidance and belief questionnaire; Numerical pain rating scale; Oswestry Disability Index; Pain education.

Introduction

Chronic pain is defined as "An unpleasant sensory and emotional experience associated with or resembling that related to actual or potential tissue damage." (IASP 2020). Chronic low back pain is also a very common complaint among the general population, and it is responsible for more years of disability than any other condition in the globe.[1,2] Limited physical activity is one of the most important variables that contribute to a chronic musculoskeletal pain condition, because it ends up in reduced mobility and may cause major changes in health status and thus quality of life in the long run.[3]

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Low back pain prevalence was found to range from 6.2% to 92% with an increase prevalence with age and feminine preponderance and most subjects (90.6%) were aged 20-29 years (mean, 24.49: range, 18-35 years), with an incidence, that's highest within the third decade of life.[4] (Dasgupta 2016)

Low back pain classified into 3 types. Acute low back pain which lasts but 6 weeks, Sub-acute low back pain which lasts between 6-12weeks, Chronic low back pain which lasts over 12 weeks.[4,5] The negative cognitive-emotional response to pain known as pain catastrophizing, which includes rumination, amplification, and helplessness, has been linked to pain severity, disability, and poor outcomes in individuals with chronic low back pain.[6] (David S Butler).

According to the Biomedical paradigm, it focuses on physical processes that affect health, such as biochemistry, physiology, and pathology of an illness. It neglects to account for social or psychological factors that may have a role in the disease. According to this paradigm, each ailment has a single underlying cause, and if that cause is addressed, the patient will be restored tohealth.[7]

CLBP's bio psychosocial paradigm acknowledges that cognitive, emotional, psychological, behavioral, physical, and social components all interact to perpetuate pain, and that these factors can all be treated with integrated multimodal therapy. Since no single model has been shown to be superior to the others, it is advised that the most effective way to employ these models is to use the right components of each in accordance with the unique needs of individual patients rather than to follow one specific model.[8,9]

Ryan and colleagues discovered that people with CLBP had lower levels of physical activity than their matched controls in a study of 15 adults with chronic low back pain (CLBP) in Glasgow, Scotland.[10, 11] This fear- avoidance behavior results in reduced levels of physical activity and physical fitness and contributes to increasing levels of disability in people with chronic pain [12, 13](Giordano2020).

Pain education has become a popular educational intervention for people with chronic pain who wish to improve their ability to self-manage. It is based on a cognitive behavioral approach that supports pain self-efficacy.[14]

Methods

Research Design: Randomized control Trail, with two parallel group of allocation ratio 1:1

Participants

Inclusion Criteria: Middle age from 25-45 years, Both Men and Women, Numerical Pain Rating Scale 4-7, Pain which lasts more than 12 weeks.

Exclusion Criteria: Spinal Stenosis Malignancy, Pregnancy induced low back pain, Fracture induced low back pain, Any histories of surgeries in past 2 months, CNS impairment, Cardiovascular, Renal Impairment, Subjects with poor mental retardation or cognition.

Sampling: Simple random sampling method.

Blinding: Evaluation with respect to result degree was conducted by assessor blind to exercise allocation evaluation with respect to result degree was conducted by assessor dazzle to work out assignment.

Study duration: 4 weeks

Study setting: Hospitals

Sample size: 40

Experimental procedure:

Informed consent was taken from 40 subjects who fulfilled the inclusion and exclusion criteria. Pre intervention detailed assessment was taken. Later the subjects were randomly allocated using simple randomization method for experimental group and conventional exercise group with 20 subjects in each group.

Procedure for Group A:

(Experimental Group) Pain education and conventional exercise:

The intervention consists of pain education and conventional exercises. The pain education session was delivered in a group setting of 20 Subjects. The intervention was delivered by physiotherapist, pain

education session was based on the manual 'Explain Pain'- Pain Adaptive Behaviour.

Step 1: Patient fulfilling eligibility criteria will be recruited & allocated to groups

Step 2: Collect history

Step 3: Assess pain, disability & QOL outcome measures using

- Numerical pain rating scale
- Oswestry low back pain questionnaire
- Fear avoidance beliefs questionnaire
- Quality of life questionnaire sf-36(QOL)

Step 4: Pain education session (pain adaptive behavior)

Pain biology:

Pain physiological and biological mechanism was discussed and explained to the subjects in a narrative way as described by David Butler in Explain Pain Manual using aBooklet

Pain coping strategies:

Active coping strategies:

learning about the problem: Talking about a stressful event with a supportive person can be an effective way to manage stress. Seeking external support instead of self-isolating and internalizing the effects of stress can greatly reduce the negative effects of a difficultsituation.

Exploring ways to improve: Relaxation techniques can help ease muscle tension, muscle spasm, aches and pain. They can release endorphins, which are the body's natural painkillers. Deep Breathing techniques.

Exploring and nudging the edges ofproblem-Staying Positive-Life is constantly throwing unexpected challenges at us changing your perspective on how you see things. Making plans -making a schedule, planning your tasks, Leaving space between schedules.

Passive coping strategies:

Avoiding activity

Doing nothing and waitingfor something to happen

Increase in physical activity

Procedure for Group B

(Control Group) conventional exercise:

Four-point kneeling: Shoulders set down in neutral, tilt the pelvis into anterior and posterior tilt then find the neutral, draw in lower abdominal to engage your core. This exercise aims to strengthen the hip, pelvis, shoulder and neck.

Single leg extension from 4-pointk neeling: Leading with the heel, lift one legup behind you, keeping your knee at 90 degrees. Think about pushing the sole of your elevated foot up towards the ceiling. Extend as far as able without arching theback.

Alternate arm and leg lifts from 4-point kneeling.: From the 4-point kneeling position alternate arm and legs are lifted off the mat. Lift right arm and left leg slowly off the floor and extent them straight out, so that leg, back and arm are roughly in one line.

Upper and oblique abdominals: From lying positions with knee straight then bending the knee the patient to come up from mat. Engage your core and raise your hip until your body is in straight line from head to toe.

Knee to chest: Lie on your back with your knees bent and your feet flat on the floor. Bring one knee to the chest, keeping the other foot flat on the floor then relax and lower the knee to the starting position.

Arm lifts: Lie on your stomach on a mat. Stretch out arms over head and slightly out to the side lift one arm with your hand positioned so that thumbs point upwards. Then relax slowly lower your arm then raise the other arm in the same manner.

Bridging. The patient lies down on the back, knees in full flexion and feet flat on the floor and close to the buttock. Then the patient lifts off the floor towards the ceiling.

Conventional exercise group performed the exercises 45 minutes per day for a period of 5 days a week for 4 weeks

Statistical Analysis:

Baseline demographic and clinical characteristics was analyzed using mean and standard deviation.

In this study the Wilcoxon signed rank test, Mann Whitney U test were used as a statistical tool for detecting the significant difference within and between the group A (experimental group) and Group B (control group).

Table 1: Baseline Characteristics of Study Participants:

SI. No	Variable	Group A (PE+CE) *	Group B (CE)*	P value (<0.05)
1	Age (mean±S.D)	35.15±4.39	35.10±4.17	0.362
2	Gender			
	Male	9	11	0.34
	Female	12	8	

*Abbreviation used: PE +CE -Pain Education and conventional Exercise, CE-Conventional Exercise.Data are mean ± standard deviation (Sd). In summary data were homogenous among both groups

Table 2: Comparison of Group A (pain education and conventional Exercise) versus Group B (conventional exercise group) using Mann Whitney U test.

S. No	Variable	Group A Pre-Test Mean ±S. D	Post Test	Group B Pre-Test Mean ±S. D	Post Test	P value (<0.05)
1.	NPRS	6.2 ± 0.83	5.3±0.80	6.3±0.73	5.25±0.78	0.726
2.	FABQ	59.05±4.98	56.2±5.31	59.25±4.95	56.2±5.31	0.002
3.	ODI	25.75±5.84	22.85±5.89	25.9±6.55	24.3±6.10	0.010
4.	QOL	53.85±3.03	54.8±3.45	56.05±2.95	57.15±3.03	0.039

*Abbreviations used: NPRS-Numerical Pain rating Scale, FABQ-Fear avoidance and Belief Questionnaire, ODI-Oswestry Disability Index, QOL-Quality of Life. The table above depicts the pre-test and post-test differences between Group A and Group B, indicating that NPRS values were not statistically significant, while FABQ, ODI, and QOL were.

Table 3: Comparison between change of scores within Group A (pain education and conventional exercise group)

S. No	Variable	Pre-test	Post-test	Difference	p-value (<0.05)
1.	NPRS	6.26±0.83	5.00±0.80	1.26	0.0009
2.	FABQ	59.05±4.98	56.2±5.31	2.85	0.0021
3.	ODI	25.75±5.84	22.85±5.89	2.90	0.0008
4.	QOL	53.85±3.03	57.05±3.45	3.2	0.0008

The above Table 3 shows pretest and post test difference value for Group A (Pain education and conventional Exercise group) Wilcoxon signed rank test was used to determine statistical significance, and it was found to be significant.

Table 4: Comparison between change of scores within Group B (conventional exercise group)

S. No	Variable	Pre test	Post test	Difference	p-value (<0.05)
1.	NPRS	6.30±0.73	5.25±0.78	0.75	0.0004
2.	FABQ	59.25±4.95	57.5±4.90	1.75	0.0004
3.	ODI	25.9±6.55	24.3±6.10	1.6	0.0044
4.	QOL	53.07±2.96	55.00±2.78	1.30	0.0042

The above Table 4 shows pretest and post test difference value for Group B (conventional Exercise group) Wilcoxon signed rank test was used to determine statistical significance, and it was found to be significant.

Table 5: Effect Size of values of Group A (pain Education Group) and Group B (conventional Exercise Group).

S. No	Variables	Group A Mean±S.D	Group B Mean±S.D	Cohens d Effect size
1.	NPRS	5.30±0.80	5.25±0.78	0.063 0.031(S)
2.	FABQ	56.2±5.31	57.5±4.90	0.25 0.12(S)
3.	ODI	22.85±5.89	24.3±6.10	0.24 0.12(S)
4.	QOL	57.05±3.45	55.00±2.78	0.65 0.31(M)

It was estimated the difference between the NPRS, FABQ, ODI, and QOL findings. With a small effect size, NPRS values showed reduced discomfort. With a modest effect size, FABQ values showed decreased fear, ODI values showed reduced disability, and QOL values showed enhanced function with a small-medium effect size.

Results

Participants in both group experienced reductionin pain with small effect size. Participants in pain education group experienced significant reduction of fear the effect size was small, reduction indisability the effect size was small, and improvement in Quality of life the effect size was small-moderate.

Discussion

The aim of this study was to find out the effectiveness of pain education on quality of life of chronic low back pain patients. The study results were interpreted based on the outcome measuresused.

Changes in Numerical Pain Rating Scale between Pain Education Group and conventional exercise Group

The result of the present study showed improvement in Numerical Pain Rating scale in both pain education group and conventional exercise group the mean difference between both groups was not statistically significant. As a result, null hypothesis will be accepted.

In a randomized control trial to assess the effect of pain education for patients with chronic low back pain, **Gema Bodes Pardo et. al.** found a large change in pain intensity (numerical pain rating scale -2.93 to -1.28 in the pain education group) at 3 months, whereas **Tegner Heidi et. al.** found only a small efficacy in chronic low back pain patients.

Changes in Fear Avoidance and Belief among pain education and conventional exercise group:

In comparison to the typical exercise group, the pain education group exhibited a decrease in fear and catastrophizing of pain. The pain education outcomes have demonstrated that it is more effective than usual in reducing fear and incapacity. Therefore, null hypothesis is rejected.

According to **Clare Creswell**, fear avoidance and pain catastrophizing were detected in 25.5percent and 15.1 percent of CLBP patients, respectively. A lesser degreeof education was also linked to pain catastrophizing and fear, according to the researchers.

Reason for improvement of Quality of life:

Physical therapists frequently employ anatomy and pathoanatomic-based models to explain pain to their patients, According to **Weiner BK et. al**. These models have not only demonstrated minimal success in reducing pain and disability, but they may also raise patients' fear, which may aggravate theirdiscomfort.

Because the patient is active compared to a more passive education attempt, the employment of booklets has been used as valuable aids in improving information retention compared to verbal communication. Which would likely aid patient in the development of much needed deep learning processes. Patients may perceive themselves as less impaired and hence be more motivated to raise their activity levels.

Conclusion

According to the findings of this study, there was no statistically significant difference between the pain education group and the conventional exercise group, showing that both groups are equally helpful in lowering pain, fear, disability, and improving quality of life.

Limitation:

The functional gain did not last, implying that future intervention development should focus on durability. In addition, a one-month follow-up of participants in this study may not be sufficient. Indeed, a longer-term follow-up duration of greater than 6 months could help in this regard.

Conflict of Interest: None

Funding Source: None

Ethical Clearance: It was obtained from ethical committee of Oxford College of Physiotherapy.

Disclaimer: The findings of this study are based solely on subject experimentation.

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